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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application of Derek Stinnes

Serial No. 09/771,368

Filed on January 26, 2001

For: Seat for Aircraft and Land Vehicles

Attorney's Docket 1112-009

Box OIPE  
Hon. Commissioner of Patents  
Washington DC 20231

Sir:

PELIMINARY AMENDMENT

Prior to taking up this case for examination, please enter the following amendment.

In the disclosure

Please enter the enclosed substitute disclosure.

In the claims

Please replace claims 1-11, with the following claims:

- 1           --12. A seat for aircraft and land vehicles each having a bottom, the seat  
2           comprising  
3           (aa ) a seat shell with a surface, having at least one guide integrated into said  
4                        surface,  
5           (b) a frame comprised of

- (i) a basic frame having a front part and a rear part, and at least one longitudinal and at least one transverse carrier for attachment to the bottom of the vehicle, and
- (ii) a transverse carrier having a front end and a rear end, said front end being disposed higher than said rear end,
- (iii) an auxiliary frame of two of said longitudinal carriers, said longitudinal carrier having a front end and a rear end, said front end being connected by at least one carrier, said guide accommodating said auxiliary frame, the front ends being rotatably mounted from said transverse carrier, and
- (iv) at least one damping element disposed approximately perpendicularly between the rear part of said basic frame and said auxiliary frame.--

--13. The seat of claim 12, further comprising a backrest having sides, and forming a part of said surface in the shape of a shell from a multilayer laminate, and wherein said guide is at least two guide pipes each laminated below the seat surface on each side thereof.--

--14. The seat of claim 13, wherein the sides of said backrest and surface are curved, and are reinforced by further laminate layers.--

1           --15. The seat of claim 12, wherein said longitudinal and trans-  
2       verse carriers comprise upper and lower carriers welded together through  
3       supports.--

1           -- 16. The seat of claim 12, wherein said front ends of said longitu-  
2       dinal carriers of said auxiliary frame are mounted between an upper longitu-  
3       dinal carrier at an upper front transverse carrier of said basic frame.--

1           -- 17. The seat of claim 12, further comprising crossing over  
2       clamps, wherein said auxiliary frame has two longitudinal carriers the front  
3       ends of which are rotatably connected by said crossing over clamps with the  
4       upper front transverse carriers of said basic frame.--

1           -- 18. The seat of claim 12, wherein said basic frame has two  
2       auxiliary frames with front and rear ends, each of said damping elements has  
3       an upper mounting and a displaceable receptacle for said mounting, said  
4       receptacles being disposed in the rear ends of the two auxiliary frames.--

1           -- 19. The seat of claim 13, wherein said damping elements have  
2       an upper mounting and a displaceable receptacle for said upper mounting,

3 and lower mountings rotatable at said basic frame, whereby shifting of said  
4 upper receptacle enables an adjustment of the slope of said seat shell.--

1 -- 20. The seat of claim 12, wherein said damping element has a  
2 cylindrical honeycomb grid from a light metal, having ends, bearings for  
3 holding said ends, and cylindrical receptacles for holding said ends in, --

4 -- 21. The seat of claim 12, further comprising a rope, wherein said  
basic frame comprises two longitudinal carriers with rear lower ends, and  
wherein the rear ends of the two longitudinal carriers of said auxiliary frame  
are connected by said rope with said rear lower ends.--

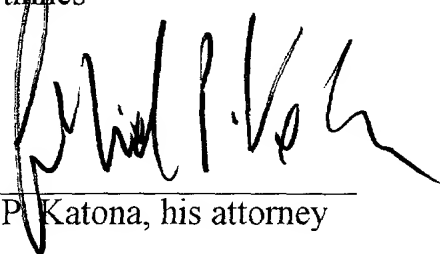
REMARKS

Claims 12-21 are in the application.

Enclosed herewith with the substitute specification a redlined copy  
showing the changes from the original translation. No new matter was added.

Favorable consideration of the claims is requested.

Respectfully submitted  
Derek Stimes

By,   
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FILED IN 09/771,368

## Seat for Aircraft and Land Vehicles, Particularly For Light Aircraft

Field of the invention

5           The present invention relates to a seat, particularly for sport aircraft and light aircraft, which meets the present safety requirements such as crash safety properties. It can also be used in small, light land vehicles, such as go-carts.

Background

10           A large number of seat structures are known for different requirements and types of vehicles. However, the basic requirements with respect to the safety properties are the same for all aircraft. This is the case particularly for the crash safety properties during the horizontal and vertical impact of an aircraft. Great strength and dimensional stability of the whole seat are required to absorb the large forces without much deformation, so that the seated person is protected.

          The mounting of damping elements in the seat frame for attenuating the effect of the impact on the person due to the strong negative acceleration is known. Elements, which are reversibly or irreversibly deformed, are known such as from German published application No. 1,755,006, utility model 8,526,591, US patent No. 4,861,103. Different arrangements result, depending on the construction of the seat frame and of the configuration of the elements. Integrating them directly into vertical supports is expensive, since additional guides are required for the damping motion during the crash.

25           According to the German published patent application No. 4,221,974, it is also known that shock-absorbing elements can be diagonally disposed in a frame of the seat. A scissors parallelogram, which makes the necessary movement possible, is obtained by four pivot bearings at the connections of the frame parts of a frame side. This solution offers much space for the damping element. The large overall height and the cost of the pivot bearings are a further disadvantage.

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          A conventional configuration of the seat, which meets the requirements, leads to relatively heavy structures, which have a negative effect on the total weight, particularly in the case of small aircraft. For this reason and because of the limited spatial relationships, only simple seat shells, which are fastened directly to the fuselage, are customary for light aircraft. However, the safety properties of these seats are completely

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inadequate and do not meet present requirements. A safety license can therefore be obtained only in the form of a single use license. A proposal is made in the German published patent application No. 3,811,939 to reduce the weight by employing a sandwich construction for seat parts. For this purpose, covering layers are glued to both sides of a sandwich panel. A high strength and a low weight are achieved with this known technology, which is, however, work intensive. However, only individual parts (seat, crossbeam, back rest) are manufactured pursuant to the invention and connected together by appropriate elements, which represents an additional expense.

#### Brief description of the invention

It is therefore an object of the invention to configure a seat, which is intended particularly for light aircraft, is low in weight, requires little space and has a high strength and dimensional stability and good damping properties and also permits the actual seat to be adjusted.

This objective is accomplished in accordance with the present invention. By the new combination of seat shell with a rotatably mounted auxiliary frame, and mainframe connected over damping elements, this seat is very light, is dimensionally stable and has a high degree of damping. Damping paths and guidance of the damping element or elements are made possible simultaneously by the rotatable mounting of auxiliary frame on the front, upper basic frame. The seat shell can be horizontally shifted on the auxiliary frame and is vertically deviated by horizontally shifting the receptacle for the upper bearing of the damping element. At the same time, this arrangement also saves space, which is important for small passenger cells.

#### Brief description of the drawing

The invention is further described through a suitable embodiment with reference being had to the drawing, wherein

Fig. 1 shows the seat shell in a side view;

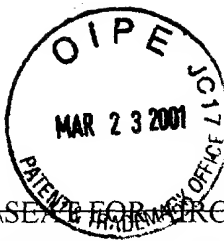
Fig. 2 shows the basic frame arrangement and the auxiliary frame arrangement in plan view; and

Fig. 3 shows the arrangement of Fig. 2.

### Detailed description of a suitable embodiment

5 A seat shell 1 with a backrest and a seating surface, is of one piece and is manufactured from a multi-layered laminate such as of fiberglass mats and rovings. A guide 2 tube suitably is a laminated in on each side below the seat surface. The seat shell is guided by the guide tube on an auxiliary frame 3. The sides of the backrest and seat surface are curved and reinforced by additional suitable narrow laminate layers and sandwich layers. In this embodiment of the invention auxiliary frame 3 and a basic frame 7 are of welded pipes. The basic frame 7 is composed of a lower 7.2 and of upper 7 longitudinal carriers and transverse carriers, which are connected by supports 7.3. The basic frame 7 is fastened to the bottom of the vehicle. The auxiliary frame 3 has two longitudinal carriers, which are connected by a transverse carrier 5. The longitudinal carriers of the auxiliary frame 3 are disposed between the longitudinal carriers 7.2 of the basic frame and, in the front, are mounted rotatably at the upper, front transverse carrier 7.1 of the basic frame 7.

10 The front ends of the two longitudinal carriers of the auxiliary frame 3 are fastened in crossing-over clamps 4, which rotatably embrace the front, upper, transverse carrier 7.1 of the basic frame 7. A pipe is pushed into each of the rear ends of the two longitudinal carrier of the auxiliary frame 3. These pipes are connected by the transverse carrier 5 and form a displaceable receptacle for the upper mounting of a set of damping element 8. The lower mountings of the damping elements 8 are rotatably provided at the basic frame 7, so that swiveling of the seat shell becomes possible by shifting the upper receptacle. The damping elements suitably have a cylindrical honeycomb grid of light metal, the ends of which are enclosed in receptacles, which at the same time form head bearings. The rear ends of the two longitudinal carrier of the auxiliary frame 3 are connected for stabilization by a rope 6 with the rear, lower ends of the two longitudinal carriers 7.2 of the basic frame 7.



1112-009

~~SEAT FOR AIRCRAFT AND LAND VEHICLES, ESPECIALLY FOR LIGHT~~  
**AIRCRAFT [Seat for Aircraft and Land Vehicles, Particularly For Light Aircraft]**

5 ~~The innovation~~ [Field of the invention]

**The present invention**] relates to a seat, particularly for sport aircraft and light aircraft, which meets the present safety requirements ~~(crash properties)~~ **[such as crash safety properties]**. It can also be used in small, light land vehicles, such as go-carts.

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**[Background]**

A large number of seat ~~constructions~~ **[structures]** are known for different ~~demands~~ **[requirements]** and types of vehicles. However, the basic requirements with respect to the safety properties are the same for all aircraft. This is the case particularly for the crash **[safety]** properties during the horizontal and vertical impact of an aircraft. Great strength and dimensional stability of the whole seat are required ~~in order~~ to absorb the large forces without much deformation, so that the seated person is protected. [

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[The mounting of damping elements in the seat frame for attenuating the effect of the impact on the person due to the strong negative acceleration is known. Elements, which are ~~deformed~~ reversibly or irreversibly, ~~are known (DE) OS 1755006, GM 8526591, US patent 4861103, etc.)~~ **[deformed , are known such as from German published application No. 1,755,006, utility model 8,526,591, US patent No. 4,861,103]**. Different arrangements result, depending on the construction of the seat frame and of the configuration of the elements. Integrating them directly into vertical supports is expensive, since additional guides are required for the damping motion during the crash.

According to the German ~~Offenlegungsschrift 4221974, it is furthermore~~ **[published patent application No. 4,221,974, it is also]** known that shock-absorbing elements ~~may~~ **[can]** be ~~disposed~~ diagonally **[disposed]** in a frame of the seat. A scissors parallelogram, which makes the necessary movement possible, is obtained by ~~means of~~ four pivot bearings at the connections of the frame parts of a frame side. This solution offers much space for ~~then~~ **[the]** damping element. The large overall height and the cost of the pivot bearings are a **[further]** disadvantage.



A conventional configuration of the seat, which meets the requirements, leads to relatively heavy ~~constructions~~ **[structures]**, which have a negative effect on the total weight, particularly in the case of small aircraft. For this reason and because of the limited spatial relationships, only simple seat shells, which are fastened directly to the fuselage, are customary for light aircraft. However, the safety properties of these seats are completely inadequate and do not meet present requirements. A safety license can therefore be obtained only in the form of a single **[use]** license. ~~In order to reduce the weight, the~~ **[A]** proposal is made in the German ~~Offenlegungsschrift 3811939 to employ~~ **[published patent application No. 3,811,939 to reduce the weight by employing]** a sandwich construction for seat parts. For this purpose, covering layers are glued to both sides of a sandwich panel. A high strength and a low weight are achieved with this known technology, which is, however, work intensive. However, only individual parts (seat, crossbeam, back rest) are manufactured pursuant to the invention and connected together by appropriate elements, which represents an additional expense.

**[Brief description of the invention]**

It is therefore an object of the invention to configure a seat, which is intended particularly for light aircraft, is low in weight, requires little space and has a high strength and dimensional stability and good damping properties and ~~furthermore~~ **[also]** permits the actual seat to be adjusted.

This objective is accomplished ~~innovatively~~ in accordance with the ~~distinguishing features of the claims. By means of~~ **[present invention. By ]** the new combination of seat shell with a rotatably mounted auxiliary frame, and mainframe connected over damping elements, this seat is very light, is dimensionally stable and has a high degree of damping. Damping paths and guidance of the damping element or elements are made possible simultaneously by the rotatable mounting of auxiliary frame on the front, upper basic frame. The seat shell can be ~~shifted~~ horizontally **[shifted]** on the auxiliary frame and is ~~deviated~~ vertically **[deviated]** by horizontally shifting the receptacle for the upper bearing of the damping element. At the same time, this arrangement also saves space, which is important for small passenger cells.

~~Further advantageous developments of the invention are listed in the in the dependent claims. In the following, the innovation is explained by means of an example. Figure~~

**[Brief description of the drawing]**

The invention is further described through a suitable embodiment with reference being had to the drawing, wherein

Fig.] 1 shows the seat shell in a side view, ~~Figure~~;

Fig.] 2 shows the basic frame arrangement and the auxiliary frame arrangement in plan view ~~and Figure 3 shows the same in front view. The seat shell 1 with the backrest and seating surface, consists~~; and

Fig. 3 shows the arrangement of Fig. 2.

**Detailed description of a suitable embodiment**

A seat shell 1 with a backrest and a seating surface, is] of one piece and is manufactured from a multi-layered laminate [such as] of fiberglass mats and rovings. A guide [2] tube ~~2~~ [suitably] is [a] laminated in on each side below the seat surface. ~~With that, the~~ [The] seat shell is guided [by the guide tube] on an auxiliary frame 3. The sides of the backrest and seat surface are curved and reinforced by additional ~~appropriate~~ [suitable] narrow laminate layers and sandwich layers. In ~~the example the~~ [this embodiment of the invention] auxiliary frame 3 and ~~the~~ [a] basic frame 7 ~~consists~~ [are] of welded pipes. The basic frame 7 is composed of a lower 7.2 and [of] upper 7 longitudinal carriers and transverse carriers, which are connected by supports 7.3. The basic frame [7] is fastened to the bottom of the vehicle. The auxiliary frame 3 ~~consists of~~ [has] two longitudinal carriers, which are connected by a transverse carrier 5. The longitudinal carriers of the auxiliary frame 3 are disposed between the longitudinal carriers 7.2 of the basic frame and, in the front, are mounted ~~rotatable~~ [rotatably] at the upper, front transverse carrier 7.1 of the basic frame 7.

The front ends of the two longitudinal ~~carrier~~ [carriers] of the auxiliary frame 3 are fastened in crossing-over clamps 4, which rotatably embrace the front, upper, transverse carrier 7.1 of the basic frame 7. ~~Into~~ [A pipe is pushed into] each of the rear ends of the two longitudinal carrier of the auxiliary frame 3, ~~a pipe is pushed~~. These pipes are connected by ~~a~~ [the] transverse carrier 5 and form a displaceable receptacle for the upper mounting of ~~the~~ [a set of] damping element 8. The lower mountings of the damping elements 8 are ~~constructed~~ rotatably [provided] at the basic frame 7, so that

swiveling of the seat shell becomes possible by shifting the upper receptacle. The damping elements ~~consist of~~ **[suitably have]** a cylindrical honeycomb grid of light metal, the ends of which are enclosed in receptacles, which at the same time form head bearings. ~~For stabilization, the~~ **[The]** rear ends of the two longitudinal carrier of the auxiliary frame 3 are connected **[for stabilization]** by a rope 6 with the rear, lower ends of the two longitudinal carriers 7.2 of the basic frame 7.